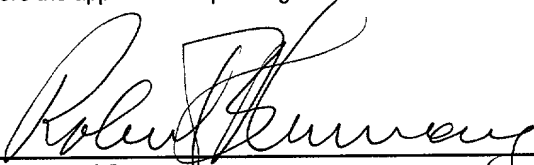


FORM PTO-1390 (REV 5-93)		U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE		ATTORNEY DOCKET NO. 108256-00008
TRANSMITTAL LETTER TO THE UNITED STATES DESIGNATED/ELECTED OFFICE (DO/EO/US) CONCERNING A FILING UNDER 35 U.S.C. 371				DATE: April 2, 2001
				U.S. APPLN. NO. (IF KNOWN, SEE 37 C.F.R. 1.5) Not Yet Assigned 09/787926
INTERNATIONAL APPLICATION NO. PCT/KR99/00595		INTERNATIONAL FILING DATE 30 September 1999		PRIORITY DATE CLAIMED 1 October 1998
TITLE OF INVENTION: MOBILE PHONE SYSTEM AND MOBILE PHONE TERMINAL USING A PLURALITY OF TELEPHONE NUMBERS				
APPLICANT(S) FOR DO/EO/US: Deok Woo KIM (Seoul, Korea)				
<ol style="list-style-type: none"> 1. <input checked="" type="checkbox"/> This is a FIRST submission of items concerning a filing under 35 U.S.C. 371. (THE BASIC FILING FEE IS ATTACHED) 2. <input type="checkbox"/> This is a SECOND or SUBSEQUENT submission of items concerning a filing under 35 U.S.C. 371. 3. <input checked="" type="checkbox"/> This express request to begin national examination procedures [35 U.S.C. 371(f)] at any time rather than delay examination until the expiration of the applicable time limit set in 35 U.S.C. 371(b) and PCT Articles 22 and 39(1). 4. <input type="checkbox"/> A proper demand for International Preliminary Amendment was made by the 19th month from the earliest claimed priority date. 5. <input checked="" type="checkbox"/> A copy of the International Application as filed [35 U.S.C. 371(c)(2)] <ol style="list-style-type: none"> a. <input type="checkbox"/> is transmitted herewith (required only if not transmitted by the International Bureau). b. <input checked="" type="checkbox"/> has been transmitted by the International Bureau. c. <input type="checkbox"/> is not required, as the application was filed in the United States Receiving Office (RO/US). 6. <input checked="" type="checkbox"/> A translation of the International Application into English [35 U.S.C. 371(c)(2)]. 7. <input checked="" type="checkbox"/> Amendments to the claims of the International Application under PCT Article 19 [35 U.S.C. 371(c)(3)] <ol style="list-style-type: none"> a. <input type="checkbox"/> are transmitted herewith (required only if not transmitted by the International Bureau). b. <input type="checkbox"/> have been transmitted by the International Bureau. c. <input type="checkbox"/> have not been made; however, the time limit for making such amendments has NOT expired. d. <input checked="" type="checkbox"/> have not been made and will not be made. 8. <input type="checkbox"/> A translation of the amendments to the claims under PCT Article 19 [35 U.S.C. 371(c)(3)]. 9. <input checked="" type="checkbox"/> An oath or declaration of the inventor(s) [35 U.S.C. 371(c)(4)]. 10. <input type="checkbox"/> A translation of the annexes to the International Preliminary Examination Report under PCT Article 36 [35 U.S.C. 371(c)(5)]. <p>Items 11 - 16 below concern other document(s) or information included:</p> <ol style="list-style-type: none"> 11. <input checked="" type="checkbox"/> An Information Disclosure Statement under 37 C.F.R. 1.97 and 1.98. 12. <input checked="" type="checkbox"/> An assignment document for recording. A separate cover sheet in compliance with 37 C.F.R. 3.28 and 3.31 is included. 13. <input checked="" type="checkbox"/> A FIRST preliminary amendment. <input type="checkbox"/> A SECOND or SUBSEQUENT preliminary amendment. 14. <input type="checkbox"/> A substitute specification. 15. <input type="checkbox"/> A change of power of attorney and/or address letter. 16. <input checked="" type="checkbox"/> Other items or information: <input checked="" type="checkbox"/> PCT/RO/401 PCT Request; PCT/ISA/210 International Search Report; PCT/IPEA/408 Written Opinion; PCT/IB/308 Notice Informing the Applicant of the Communication of the International Application to the Designated Offices; Verified Statement Claiming Small Entity Status Drawings (10 sheets) 				

U.S. APPLICATION (IF KNOWN) SEE 37 C.F.R. 1.501 No. Not Assigned 09/787926	INTERNATIONAL APPLICATION NO. PCT/KR99/00595	ATTORNEY DOCKET NO. 108256-00008 DATE: April 2, 2001				
*7. <input checked="" type="checkbox"/> The following fees are submitted: Basic National Fee [37 C.F.R. 1.492(a)(1)-(5)]: Search Report has been prepared by the EPO or JPO.....\$860.00 • International preliminary examination fee paid to USPTO (37 C.F.R. 1.482).....\$690.00 No international preliminary examination fee paid to USPTO (37 C.F.R. 1.482) but international search fee paid to USPTO [37 C.F.R. 1.445(a)(2)].....\$710.00 Neither international preliminary examination fee (37 C.F.R. 1.482) or international search fee [37 C.F.R. 1.445(a)(2)] paid to USPTO.....\$1,000.00 International preliminary examination fee paid to USPTO (37 C.F.R. 1.482) and all claims satisfied provisions of PCT Article 33(2)-(4).....\$ 100.00		<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left; width: 60%;">CALCULATIONS</th> <th style="text-align: left; width: 40%;">PTO USE ONLY</th> </tr> </thead> <tbody> <tr> <td colspan="2" style="height: 100px;"></td> </tr> </tbody> </table>	CALCULATIONS	PTO USE ONLY		
CALCULATIONS	PTO USE ONLY					
ENTER APPROPRIATE BASIC FEE AMOUNT =		\$ 1,000.00				
Surcharge of \$130.00 for furnishing the oath or declaration later than <input type="checkbox"/> 20 <input type="checkbox"/> 30 months from the earliest claimed priority date [37 C.F.R. 1.492(e)].		\$ 0.00				
Claims	Number Filed	Number Extra				
Total Claims	35 - 20 =	15				
Independent Claims	11 - 3 =	8				
Multiple dependent claim(s) (if applicable)		+ \$270.00				
TOTAL OF ABOVE CALCULATIONS =		\$ 1,910.00				
Reduction by one-half for filing by small entity, if applicable. Verified Small Entity statement must also be filed. (Note 37 C.F.R. 1.9, 1.27, 1.28).		\$ 955.00				
SUBTOTAL =		\$ 955.00				
Processing fee of \$130.00 for furnishing the English translation later the <input type="checkbox"/> 20 <input type="checkbox"/> 30 months from the earliest claimed priority date [37 C.F.R. 1.492(f)].		\$ 0.00				
TOTAL NATIONAL FEE =		\$ 955.00				
Fee for recording the enclosed assignment [37 C.F.R. 1.21(h)]. The assignment must be accompanied by an appropriate cover sheet (37 C.F.R. 3.28, 3.31). \$40.00 per property.		\$ 40.00				
TOTAL FEES ENCLOSED =		\$ 995.00				
		Amount to be refunded \$				
		Charged \$				
a. <input checked="" type="checkbox"/> A check in the amount of \$995.00 to cover the above fees is enclosed. b. <input type="checkbox"/> Please charge my Deposit Account No. 01-2300 in the amount of \$ to cover the above fee. A duplicate copy of this sheet is enclosed. c. <input checked="" type="checkbox"/> The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any overpayment to Deposit Account No. 01-2300.						
NOTE: Where an appropriate time limit under 37 C.F.R. 1.494 or 1.495 has not been met, a petition to revive [37 C.F.R. 1.137(a) or (b)] must be filed and granted to restore the application to pending status.						
SEND ALL CORRESPONDENCE TO: Arent Fox Kintner Plotkin & Kahn 1050 Connecticut Avenue, N.W. Suite 600 Washington, D.C. 20036-5339 Tel: (202) 857-6000 Fax: (202) 638-4810						
 Robert B. Murray Reg. No. 22,980						

PATENT APPLICATION

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re the Application of:

Deok Woo KIM

Group Art Unit: Unknown

Application No.: Not Yet Assigned

Examiner: Unknown

Filed: April 2, 2001

Attorney Dkt. No.: 108256-00008

For: MOBILE PHONE SYSTEM AND MOBILE PHONE TERMINAL USING A
PLURALITY OF TELEPHONE NUMBERS

PRELIMINARY AMENDMENT

Commissioner for Patents
Washington, D.C. 20231

April 2, 2001

Sir:

Prior to initial examination of the application, please amend the above-identified
application as follows:

IN THE CLAIMS:

Please amend claims 14, 15, 16, 17, 19 and 33 as follows:

14. (Amended) A call responding method according to claim 12,
wherein said step (c) comprises the steps of:

reading out data of call responding method stored in connection with the
extracted phone terminal identification information;

checking if the read data of call responding method indicates call rejection; and

transmitting a call rejection signal to a base station based on said checked result.

15. (Amended) A call responding method according to claim 12, wherein said step (c) comprises the steps of:

reading out data of call responding method stored in connection with the extracted phone terminal identification information; checking if the read data of call responding method indicates call reverting to a voice mailing system; and transmitting a call reverting signal to a base station based on said checked result.

16. (Amended) A call responding method according to claim 12, wherein said step (c) comprises the steps of:

reading out data of call responding method stored in connection with the extracted phone terminal identification information;

checking if the read data of call responding method indicates time-conditional call connection; and

transmitting a call connection restricting signal to a base station based on said checked result and current time.

17. (Amended) A call responding method according to claim 12, wherein said step (c) comprises the steps of:

(c1) reading out data of call responding method stored in connection with the extracted phone terminal identification information;

(c2) checking if the read data of call responding method indicates region-conditional call connection; and

(c3) transmitting a call connection restricting signal to a base station based on said checked result and current location of the mobile phone terminal.

19. (Amended) A call responding method according to claim 12 , wherein said step (c) comprises the steps of:

reading out pre-stored data of call responding method corresponds to the extracted phone terminal identification information;

checking if the read data of call responding method indicates user-conditional call connection; and

transmitting a call connection restricting signal to a base station based on said checked result and user's key selection.

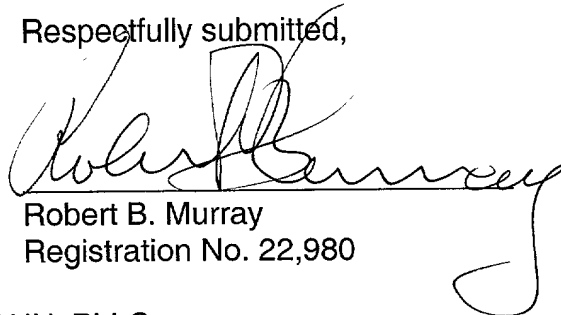
33. (Amended) A voice mailing method according to claim 31, further comprising the step of transmitting via radio a signal informing that a voice message has been arrived newly.

REMARKS

Claims 1-35 are pending in this application. By this Amendment, claims 14, 15, 16, 17, 19 and 33 are amended to delete multiple dependency. No new matter is contained in the amendments.

Please charge any fee deficiency or credit any overpayment to Deposit Account No. 01-2300.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "Robert B. Murray", is written over a horizontal line. The signature is fluid and cursive.

Robert B. Murray
Registration No. 22,980

ARENT FOX KINTNER PLOTKIN & KAHN, PLLC
1050 Connecticut Avenue, N.W.,
Suite 600
Washington, D.C. 20036-5339
Tel: (202) 857-6000
Fax: (202) 638-4810

MARKED-UP ORIGINAL CLAIMS

14. (Amended) A call responding method according to claim 12_[or 13], wherein said step (c) comprises the steps of:

reading out data of call responding method stored in connection with the extracted phone terminal identification information;

checking if the read data of call responding method indicates call rejection;
and

transmitting a call rejection signal to a base station based on said checked result.

15. (Amended) A call responding method according to claim 12 [or 13], wherein said step (c) comprises the steps of:

reading out data of call responding method stored in connection with the extracted phone terminal identification information; checking if the read data of call responding method indicates call reverting to a voice mailing system; and
transmitting a call reverting signal to a base station based on said checked result.

16. (Amended) A call responding method according to claim 12 [or 13], wherein said step (c) comprises the steps of:

reading out data of call responding method stored in connection with the extracted phone terminal identification information;

checking if the read data of call responding method indicates time-conditional call connection; and

transmitting a call connection restricting signal to a base station based on said checked result and current time.

17. (Amended) A call responding method according to claim 12 [or 13], wherein said step (c) comprises the steps of:

(c1) reading out data of call responding method stored in connection with the extracted phone terminal identification information;

(c2) checking if the read data of call responding method indicates region-conditional call connection; and

(c3) transmitting a call connection restricting signal to a base station based on said checked result and current location of the mobile phone terminal.

19. (Amended) A call responding method according to claim 12 [or 13], wherein said step (c) comprises the steps of:

reading out pre-stored data of call responding method corresponds to the extracted phone terminal identification information;

checking if the read data of call responding method indicates user-conditional call connection; and

transmitting a call connection restricting signal to a base station based on said checked result and user's key selection.

33. (Amended) A voice mailing method according to claim 31 [or 32], further comprising the step of transmitting via radio a signal informing that a voice message has been arrived newly.

DESCRIPTION

MOBILE PHONE SYSTEM AND MOBILE PHONE TERMINAL USING A PLURALITY OF TELEPHONE NUMBERS

1. Technical Field

5 The present invention relates to a mobile phone system and mobile phone terminal which assign a plurality of phone numbers to single mobile phone and perform various call processing and/or responses according to a requested phone number contained in call request signal among the
10 assigned two or more mobile phone numbers.

2. Background Art

In general, telephone terminals are regarded as the most universal communication means to transceive (transmit/receive) messages that users want to send via
15 voice format. The telephone terminals are divided into a wired phone and a mobile phone terminal. The wired phone terminal is sub-divided into a corded phone and a cordless phone terminal. The cordless phone terminal refers to a phone terminal having additional portable
20 apparatus, that is, a cordless handset used for communicating with main set of a corded phone terminal. This cordless phone terminal has a limited usable range

of telephone call due to the fact that the portable handset always has to communicate with main set of a corded phone terminal.

On the other hand, the mobile phone terminal can
5 directly connect to telephone network and communicate irrespective of main set of a corded phone terminal, having broad range of telephone call. Especially, the usage of mobile phone terminals has been increasing rapidly because telephone call service of good quality
10 and various value-added services is provided with recent development of communication technology.

By the way, aforementioned mobile phone terminal has a unique phone number assigned to itself such that it can be distinguished from each others. In addition, the
15 available spare frequency band which will be allocated to new mobile communication system is dramatically decreasing due to the rapidly increasing usage of mobile phones.

Therefore, the conventional communication schemes such
20 as FDMA (Frequency Division Multiple Access) and TDMA (Time Division Multiple Access) are being replaced with a new communication scheme that can make more efficient use of the given frequency band, that is to say, CDMA (Code Division Multiple Access), which recently has been

proposed by Qualcomm Inc.

However, the conventional mobile phone service has some drawbacks. Firstly, a mobile phone subscriber is not allowed to have a plurality of phone numbers with single
5 phone terminal, so that he or she has only single phone number on single mobile phone. Therefore, users who want to have plural phone numbers have no choice but to purchase the same number of mobile phone terminals, giving subscribers economic burden and much inconvenience.
10 Secondly, a callee with single mobile phone can not identify a caller, which makes the callee respond to the caller without having an idea of who is calling and may give subscribers a mental burden. In addition, a callee can not figure out if the received call is emergent or
15 not, making it difficult to promptly respond to a emergency call.

So, in order to mitigate the economic burden that the multiple mobile phone terminals must be purchased, several conventional arts have already been proposed in
20 Korea patent publication No. 96-16879 and Korean patent preliminary publication No. 97-705315.

However, even though the conventional arts have proposed a method for assigning a plurality of phone numbers to single mobile phone terminal, all of the

plural phone identification information (numbers) in the proposed conventional arts are independent subscriber phone numbers which can be assigned to and used for other phone terminal users and they are all assigned to single
5 subscriber who has joined mobile phone service. Therefore the conventional arts fail to provide method for using the limited frequency band more efficiently. In addition, the conventional arts do not present appropriate call response and call processing methods for using plural
10 phone numbers in mobile phone terminals.

Seeing from the viewpoint of power consumption, which is very important in mobile phones because the installed battery is of small quantity, the conventional arts also has a disadvantage of consuming much power due to the
15 process of continuous communication with mobile phone base station for a instant paging/accessing, that is, periodically transmitting a plurality of phone terminal identification information corresponding to the assigned plural subscriber phone numbers to inform mobile phone
20 system of mobile phone's position and status. This results in rapid increase of power consumption needed for communicating with base stations in standby mode, hence reducing battery operation time dramatically.

3. Disclosure of Invention

It is an object of the present invention to provide a mobile phone system and a mobile phone terminal using a plurality of telephone numbers. A plurality of telephone
5 numbers are assigned to single mobile phone terminal such that the limited frequency band can be utilized efficiently. Call response and call processing can be performed differently according to called phone numbers, each number is correspondent to each assigned plural
10 telephone numbers respectively.

It is another object to provide a voice mailing service of storing voice messages separately according to plural phone numbers and identifying pre-stored voice messages distinguishably for all of the plural phone numbers.

15 The mobile phone system in accordance with the present invention, which has been proposed to achieve the mentioned objectives, firstly information on called part, that is, telephone number is extracted from a received call request signal and then whether or not the call
20 request signal is associated with a mobile phone terminal which has joined multiple phone numbers service is checked based on the extracted telephone number. If the telephone number is for plural telephone number service, the phone terminal identification information and phone

number identification information which are corresponding to the called telephone number are extracted, the phone number identification information discriminating plural telephone numbers. And then, the call request is

5 processed complying with the extracted identification information. As a result of the call processing, the phone terminal identification information or phone number identification information is extracted from a call connection request signal received from a switching node

10 via radio at the side of mobile phone terminal, and a mobile terminal may respond to the call connection request differently based on the extracted the phone terminal identification information or phone number identification information and display the extracted

15 information.

The mobile phone system and terminal according to the present invention has many advantages. Firstly, subscribers can use multiple phone numbers with single mobile phone. Secondly, subscribers can take versatile

20 call processing, call response and voice mailing service in accordance with the multiple phone numbers. Thirdly, battery power consumption which is needed for communicating with mobile base station in standby mode can be minimized.

4. Brief Description of Drawings

The accompanying drawings, which are included to provide a further understanding of the invention, illustrate the preferred embodiment of this invention, and together with the description, serve to explain the principles of the present invention.

In the drawings:

FIG. 1 shows a typical block diagram of general mobile phone network;

10 FIG. 2 shows a block diagram of a mobile switching node in accordance with the present invention;

FIG. 3 describes CDMA mobile phone code channels;

FIG. 4 shows a block diagram of a mobile phone terminal in accordance with the present invention;

15 FIGS. 5A and 5B are flow charts for describing the operation of a mobile phone system in accordance with the present invention;

FIGS. 6A and 6B are flow charts for describing call processing methods of mobile switching node in accordance
20 with the present invention;

FIGS. 7A and 7B are flow charts for describing call responding methods of a mobile phone terminal in accordance with the present invention; and

FIG. 8 is a flow chart for describing voice mailing

procedures of a mobile phone system in accordance with the present invention.

5. Modes for Carrying out the Invention

The preferred embodiments of the present invention will be described hereinafter in detail referring to the accompanying drawings.

FIG. 1 depicts a conceptual representation of the mobile phone network using a plurality of phone numbers, which includes a telephone communication network 2 linked with multiple telephones 1, a telephone network interface unit 3 connected to the wired and/or wireless telephone communication network 2, a mobile phone controller 4 performing a call processing according to a call request signal received via the telephone communication interface unit 3, a data storage unit 5 storing data necessary for call processing of the mobile phone controller 3, and mobile phone base stations 6 sending the call-processed signal to a mobile phones via radio.

FIG. 2 shows a more detailed block diagram of mobile switching node Sx including functional blocks of the telephone network interface unit 3, the mobile phone controller 4, and the data storage unit 5.

FIG. 2 depicts sub-blocks of a telephone network interface unit 11 transceiving call signal and voice

signal with being linked to the wired and/or wireless telephone communication network 2, a hard disk 14 storing telephone identification information contained in a call request signal and call processing data corresponding to the telephone identification information, a database 20 where voice message and guiding message are stored in digital data format, an ADPCM unit 19 which performs adaptive differential quantization of voice signal into voice digital data, a voice conversion unit 18 which transforms the digital data stored in database into voice signal, a DTMF processor 12 which interprets dual tone multiple frequency (DTMF) signals received from the telephone network interface unit 11, a controller 13 which generates control signals in accordance with the DTMF signal, a call processing unit 15 which generates a call connection request signal in accordance with the control signals, several multiplexers 21 transmitting a call connection request signal generated from the call processing unit 15 to multiple mobile phone base stations or selectively outputting signals received from mobile phone base stations, and a link interface unit 22 transmitting switched signals of the multiplexers 21 to another mobile switching node.

The operation of mobile switching node Sx of FIG. 2

will now be described in detail with reference to the accompanying drawings

FIG. 3 shows mobile phone code channels of CDMA system to which the embodiment of the present invention is applied.

The conventional CDMA signal uses 64 code channels consisting of 1 pilot channel, 1 sync channel, 7 paging channels, and 55 traffic channels.

The pilot channel transmits an unique non-modulated signal generated by mobile phone base station, which will be used for discriminating cell or sector of the mobile phone base station. The sync channel is used for synchronization of a mobile phone to a base station.

The paging channels are used for mobile phone base station to call a mobile phone and the traffic channels are used for transceiving voice messages of a mobile phone responded to the call. The paging channels also have information with which the phone number requested by a caller can be recognized. The paging channels in accordance with the present invention contain a phone terminal identification information for indicating the called mobile phone and plural phone number identification information for discriminating plural phone numbers used by the requested mobile phone.

Now, the operation of the mobile switching node Sx is explained. Upon receiving a call request signal via the telephone interface unit 11, the controller 13 detects a phone terminal identification information contained in the call request signal and checks if the requested mobile phone has joined a service using a plurality of phone numbers. If the phone terminal identification information is associated with a mobile phone using a plurality of phone numbers, the controller 13 extracts associated phone number identification information and performs call processing such as sending call connection request signal corresponding to the extracted phone number identification information.

Meanwhile, a mobile phone 7 extracts a phone terminal identification information contained in a call connection request signal received through mobile phone base station 6 from the mobile switching node Sx and checks if it corresponds to itself. If then, the mobile phone extracts a phone number identification information contained in the call connection request signal and recognizes that there has been a call connection request to a phone number among a plurality of phone numbers pre-assigned to itself.

A preferred examples for recognizing the plural

telephone numbers is explained. Suppose that a phone terminal identification information used by a mobile phone, which is to be carried in the paging channels, is 8-bit length code and the mobile phone uses 4 different plural phone terminal numbers.

In such a case, the minimum number of data bit to discriminate the 4 telephone numbers assigned to a multiple number subscriber is 2 (00, 01, 10, 11). Thus, the paging channel is transmitted, which contains a phone terminal identification information of 8 bits for discriminating a requested mobile phone and a phone number identification information of 2 bits for discriminating 4 assigned telephone numbers used by a callee. the telephone numbers used by a subscriber are assigned independently of the digit values of phone number identification information since the called telephone number is translated into a phone terminal identification information and one of phone number identification information.

FIG. 4 shows the block diagram of a mobile phone terminal in accordance with the present invention, which comprises a frequency conversion unit converting up/down frequency of a signal received from a mobile phone base station or a signal generated from a mobile

Parameter	Estimate	Standard Error	z-Statistic	p-Value	95% Confidence Interval
Intercept	1.0000	0.0000			
Age	0.0000	0.0000			
Gender	0.0000	0.0000			
Marital Status	0.0000	0.0000			
Education	0.0000	0.0000			
Income	0.0000	0.0000			
Health Status	0.0000	0.0000			
Employment Status	0.0000	0.0000			
Living Arrangements	0.0000	0.0000			
Religious Beliefs	0.0000	0.0000			
Political Views	0.0000	0.0000			
Volunteer Work	0.0000	0.0000			
Charitable Contributions	0.0000	0.0000			
Community Involvement	0.0000	0.0000			
Family Size	0.0000	0.0000			
Home Ownership	0.0000	0.0000			
Travel Frequency	0.0000	0.0000			
Language Proficiency	0.0000	0.0000			
Disability Status	0.0000	0.0000			
Substance Use	0.0000	0.0000			
Mental Health	0.0000	0.0000			
Physical Health	0.0000	0.0000			
Life Satisfaction	0.0000	0.0000			
Overall Well-being	0.0000	0.0000			

15

20

Specifically, FIG. 5A is a flow chart of operations performed in the mobile switching node Sx, and FIG. 5B is a flow chart of operations performed in a mobile phone terminal, where the operations of mobile phone base

station is omitted.

The following explains the operation of a mobile phone system allowing a plurality of telephone numbers in accordance with the present invention.

5 When mobile switching node Sx receives a call request signal during standby mode, which means that a call request signal is received through the telephone interface unit 11 linked to the wired and/or wireless telephone communication network 2, the DTMF processor 12
10 detects dual tone multiple frequency signal contained in the received call request signal and outputs digit information corresponding the detected dual tone multiple frequency signal. Using the digit information which corresponds to a telephone number of a called mobile
15 terminal, the controller 13 checks if the called telephone number is served by the mobile switching node Sx itself and if it is associated with plural telephone number service. The checking process is performed by searching the hard disk 14 containing the subscribers'
20 service information.

If it is a telephone number for a subscriber who uses plural telephone numbers, the controller 13 extracts phone terminal identification information related to the requested telephone number from the subscribers' service

information or the call request signal if provided, and then transmits a phone number identification information corresponding to the requested telephone number to the call processing unit 15 (S13) together with the phone
5 terminal identification information, a phone number identification information being stored in the hard disk 14 in connection with the extracted phone terminal identification information. The call processing unit 15 generates a call connection request signal containing
10 both the phone terminal identification information and phone number identification information, based on the call request from the controller 13, and transmits it to one of the multiplexers 21 linked with mobile phone base stations, making the call connection request signal be
15 sent to a mobile phone (S14).

Meantime, upon receiving (S31) the call connection request signal through mobile phone base station during standby mode (S30), a mobile phone terminal detects a phone terminal identification information contained in
20 the call connection request signal and checks if itself is requested. Considering these procedures more specifically, the frequency conversion unit 21 converts a signal received from a base station via antenna into a intermediate frequency signal and then into baseband

signal. The mod/demodulation unit 32 demodulates the baseband signal into digital signal.

The protocol processing unit 33 interprets the demodulated digital signal into decrypted data from which
5 the microprocessor 34 extracts the phone terminal identification information. Then, the microprocessor 34 checks whether or not the extracted phone terminal identification information corresponds to its own identification information pre-stored in the memory 39.
10 If the extracted phone terminal identification information corresponds to its own one, the microprocessor 34 extracts a phone number identification information from the decrypted data interpreted by the protocol processing unit 33, and reads out data of call
15 response preset for the extracted phone number identification information from the memory 39.

After then, the microprocessor 34 checks what type of response mode the read data of call response indicates. If the read data of call response indicates a normal call
20 responding mode, the microprocessor 34 retrieves and checks an alert data for call arrival associated with the extracted phone number identification information which has been stored in the memory 39, and controls the alerting device, which may be the microphone 37 or the

display unit 38, to output alerting signal corresponding to the read alert data. For example, if the alert data for call arrival indicates sound, an alerting signal can be either "bee-bee" or "too-too" sound according to the 5 phone number identification information, so that the type of alerting sound enables a callee to recognize a called telephone number directly and immediately.

As another example, if an alert data for call arrival is vibration, a callee can distinguish a called telephone 10 number by recognizing the period or magnitude of vibration pre-specified according to the phone number identification information. In a case that an alert data for call arrival is set to a lamp such as light emitting diode (LED), a called telephone number can be 15 discriminated by a callee based on the brightness or on-and-off period of a lamp in the display unit 38 since the brightness or the on-and-off period is differently preset according to each of the phone number identification information. In a case that an alert data for call 20 arrival is set to characters, a called telephone number can be discriminated by a callee based on alerting characters showing the phone number identification information in direct as displayed in the display unit 38.

After alerting the call arrival, if there enters a key

through a keypad unit 41 (S37) to accept the call connection request, a call response signal responding to the call connection request signal is sent to any mobile phone base station (S38), thereby a call connection can
5 be established.

The operation for call connection is explained in more detail. If a predetermined key such as a "SND" key on the keypad unit 41 is entered, the microprocessor 34 detects the key-in and then controls the protocol processing unit
10 33 to generate a call response data. The call response data generated in the protocol processing unit 33 is modulated into a call response signal by the mod/demodulation unit 32 and again are converted to a high-frequency signal by the frequency conversion unit 31,
15 being transmitted via radio.

The call response signal is transmitted to mobile switching node Sx via mobile phone base station. The mobile switching node Sx receives the call response signal and checks if the received call response signal is
20 based on conditional or unconditional call connection (S17). If the call response signal indicates unconditional-based, then the controller 13 of mobile switching node Sx controls the switching unit 16 and the multiplexer 21 to setup a connection between a caller and

a callee.

If the mobile phone terminal gets a keypad signal of ending call connection from the keypad unit 41 while connection is setup, the mobile phone terminal transmits
5 a call disconnection signal to the mobile switching node Sx via mobile phone base station. Upon receiving the call disconnection signal (S19), the mobile switching node Sx disconnects the signal path between caller and callee (S40) and enters standby mode (S20), thereby the mobile
10 phone terminal also goes back to standby mode (S41).

Meanwhile, the steps S22 and S42 of FIG. 5A and 5B representing conditional call connection processes a requested call in different ways according to call response data of a mobile phone terminal or call
15 processing data of the mobile switching node Sx1.

The conditional call connection can be performed independently in either a mobile phone terminal or a mobile switching node depending upon which is easier to embody. Several examples of conditional call connection
20 are explained as follow referring FIGS. 6A, 6B, 7A, and 7B.

FIGS. 6A and 6B show examples that a conditional call connection is processed in mobile switching node Sx independently of mobile phone terminal. At first, the

controller 13 searches for a phone terminal identification information corresponding to a called telephone number contained in a received call request signal (S51) during standby mode (S50), and, if
5 discovered, checks whether the discovered phone terminal identification is associated with a mobile phone terminal having plural telephone numbers. If then, the controller 13 also navigates the hard disk 14 to find phone number identification information corresponding to telephone
10 number which current call is requested to.

The controller 13 reads out call processing information stored in connection with the found phone number identification information in hard disk 14 and checks whether the read call processing information indicates
15 call rejection or not. If the call processing information indicates call rejection, guiding message data having been stored in the database 20 in format of digital compressed data are retrieved. The retrieved guiding message data are restored to voice analog signal by the
20 voice conversion unit 18, and transmitted to the caller, notifying that the request call has been rejected.

In addition, as for the guiding messages corresponding to the call rejection, it is more desirable to adopt indirect and polite expression rather than announcement

expressing call denial directly so that a caller may not feel unpleasant. For example, a guiding message can be like this, "it is impossible to connect the requested subscriber now because the mobile phone has been powered-
5 off, please call it again later". Such a expression can lead the caller not to recognize that the requested subscriber is rejecting his or her call.

If the call processing information stored in connection with the found phone number identification information
10 indicates time-conditional call (S57), the controller 13 detects current time (S58) and compares it with call restriction time or call connection time which is preset by a subscriber's request (S59). If the current time is within the preset call restriction time, a guiding
15 message representing the above expression is retrieved and transmitted to the caller, and if the current time does not belong to the call restriction time, normal call processing operation such as transmitting a call request signal is accomplished, which has been described
20 hereinbefore.

If the call processing information stored in connection with the found phone number identification information indicates call routing to voice mailing system (S70), a guiding message informing that the request call is re-

routed to voice mailing system is transmitted (S71) and the conventional voice mailing service is provided after connection to the voice mailing system is established (S72). In case that the voice mailing system is united to
5 a mobile switching node as shown FIG. 2, analog voice signal received through the telephone network interface unit 11 is converted into digital data by the ADPCM unit 19 and is stored in connection with the extracted phone terminal identification information in the database 20.

10 If the call processing information stored in connection with the found phone number identification information indicates region-conditional call (S74), the controller 13 detects current location (S75) by interpreting the pilot and/or paging channel signal from neighboring
15 mobile base station, and compares current location with call restriction region which is preset by a subscriber's request (S75). if the detected current location is within the preset call restriction region, a guiding message refusing call connection is transmitted and again standby
20 mode is sustained (S73).

In cases of the call restriction, time-conditional call connection, and region-conditional call connection, the requested call can be rejected such a way that a guiding message refusing call connection is replaced with a voice

menu message of voice mailing service and the request call is unconditionally re-routed to a voice mailing system.

FIGS. 7A and 7B are flow charts for showing how to respond a call connection request response according to the type of conditional call connection in a mobile phone terminal. When a call connection request signal from a mobile switching node is received in standby mode (S81), a phone terminal identification information is extracted from the received call connection request signal (S82). Then, mobile phone terminal checks if the call connection request signal is destined to its own terminal, if then, a phone number identification information contained in the call connection request signal is extracted too (S83).

15 The microprocessor 34 of mobile phone terminal reads out the data of call response stored in connection with the extracted phone number identification information from the memory 39 and checks whether the read data of call response indicates call rejection or not. If it is

20 call rejection, the mobile phone terminal sends call response signal notifying call rejection to a neighboring base station (S85) and the mobile switching node Sx connected to the base station receives the call response signal whereby the mobile switching node Sx performs the

operation of call rejection.

If the read data of call response associated with the extracted phone number identification information indicates time-conditional call, current time is
5 retrieved (S87) from a timer (not figured) or is obtained from the time information received from mobile base stations and then is compared (S89) with call restriction time or call connection time which is preset by a user's key-ins for each phone number identification
10 information. If the detected or obtained current time is within the preset call restriction time, the call response signal notifying call rejection is transmitted (S85) to a mobile base station as aforementioned.

If the read data of call response associated with the
15 extracted phone number identification information indicates call reverting to voice mailing system (S100), a call response signal to revert the call connection to voice mailing system is generated and transmitted (S101).
If the read data of call response associated with the
20 extracted phone number identification information indicates region-conditional call (S103), call responding procedure is as follows. At first, the current location of a mobile phone terminal is evaluated by detecting and analyzing non-modulated signal of pilot channel which

discriminates the cell or sector of a certain base station, and is compared with the call restriction region preset by user in connection with the phone number identification information. If the current location
5 belongs to the call restriction region, the call response signal to reject the call connection request is transmitted (S101) and again standby mode is sustained (S102).

If the read data of call response associated with the
10 extracted phone number identification information indicates user-conditional call response (S107) in which a user decide how the call connection request to be processed, an alert information on call arrival stored in connection with the phone number identification
15 information is retrieved from the memory 39 and an alert signal of call arrival assigned by the retrieved alert information on call arrival is generated (S108). After then, if a user presses a key to select call response mode (S109), call response processing is performed
20 according to the user's selection (S110). The user can select 'call connection', 'call rejection', or 'conditional connection' by pressing corresponding key. For example, if the user selects a time-conditional call connection, a mobile phone terminal performs above-

mentioned procedures of time-conditional call connection, that is, it detects current time, comparing the current time with call restriction time, and requesting call connection or call rejection to a mobile switching node.

5 In a case of refusing call connection according to 'call restriction', 'time-conditional call connection', 'call reverting', and 'region-conditional call connection', the alert operation of call arrival described above, for example alarm sound or phone
10 vibration, according to the call alerting information stored in connection with each phone number identification information can be omitted.

Considering the communication between a mobile phone and a corresponding base station for the present
15 invention, it is enough to send only a common phone terminal identification information in standby mode in order to notify neighboring base stations of the location of a mobile phone terminal since plural telephone numbers used by a subscriber can be recognized from a common
20 phone terminal identification information and plural phone number identification information being different with each other. Therefore power consumption needed for transmitting information in standby mode can be reduced.

FIG. 8 shows a flow chart for a method of voice mailing

service in a mobile phone system according to the present invention. At first, upon receiving (S120) a call request signal through the telephone network interface unit 11, the controller 13 extracts a called telephone number from
5 the call request signal, searches for a phone terminal identification information corresponding to the called telephone number, and, if it discovered, checks whether a mobile phone terminal which the call request is destined to has joined plural telephone number service or not
10 (S121). If the mobile phone has joined plural telephone number service, the controller 13 also searches for a phone number identification information corresponding to the called telephone number on the subscribers' service information (S122).
15 Then, the requested call is diverted to voice mailing system according to the call processing or call response as was explained referring to FIG. 6B, or is connected to voice mailing system through a conventional connection procedure (S123), where it is checked (S124) if the
20 requested voice mailing service is voice recording or voice listening. In a case of voice recording, the controller 13 retrieves guiding message data for voice recording, which may be expression of "after bee sounds, please record your message and push the asterisk button

when the recording finishes", stored in the database 20, and the retrieved data are converted into analog voice signal by the voice conversion unit 18. After outputting a voice guiding message (S125), the controller 13 waits
5 to receive voice messages from the caller.

If voice signal is received (S126), it is quantized into compressed digital data by the ADPCM unit 19. Upon receiving a key (for example '#') confirming that voice to be recorded is finished (S127), the controller 13
10 stores the compressed digital data in the database 20 together with the discovered phone number identification information (S128).

If the requested voice mailing service is voice listening at the step S124, the controller 13 reads out a
15 guiding message data demanding the entrance of password from the database 20.

The read guiding message data like "please enter the password" is converted into analog voice signal by the voice conversion unit 18, which is then outputted (S130).
20 After then, if the entered password matches with a pre-stored one (S131), the controller 13 sequentially retrieves all of the voice messages recorded and all the phone number identification information stored in connection with corresponding voice messages (S132). Both

the retrieved phone number identification information and the recorded voice data are converted into voice signal by the voice conversion unit 18 and sent to a user who has requested voice listening service, so that the user
5 gets not only the stored messages but also the corresponding telephone number to which the recorded message is destined.

The above explanation specifically describes the structure and operation of a mobile phone system and
10 mobile phone terminal as an embodiment of the present invention, which use plural telephone numbers being a combination of a phone terminal identification information and plural phone number identification information. However, this is only a preferred embodiment
15 of the present invention, therefore the present invention can be further extended, if necessary, to a mobile phone system and a terminal that use plural phone terminal identification information in order to use plural telephone numbers. In such a embodiment, diverse call
20 processing, call response and voice mailing service suggested by the present invention also can be done successfully.

CLAIMS

1. A mobile phone terminal using a plurality of telephone numbers, comprising:

a first means for demodulating a received call connection request signal into digital data;

a second means for extracting a phone terminal identification information and a phone number identification information from the demodulated data; and

a third means for outputting a signal of call arrival corresponding to the extracted phone number identification information.

2. A mobile phone terminal according to claim 1, wherein said second means compares the extracted phone terminal identification number with a pre-stored phone terminal identification number, and extracts a phone number identification information contained in the demodulated call connection request data, when the two phone terminal identification numbers are equal.

3. A mobile phone terminal according to claim 1, wherein said third means outputs call arrival sounds which are different depending upon the extracted phone number identification information.

4. A mobile phone terminal according to claim 1, wherein

said third means vibrates differently depending upon the extracted phone number identification information.

5. A mobile phone terminal according to claim 1, wherein said third means displays an LED differently depending upon the extracted phone number identification information.

6. A mobile phone terminal according to claim 1, wherein said third means displays call arrival characters which are different depending upon the extracted phone number identification information.

7. A mobile phone terminal using a plurality of telephone numbers, comprising:

a first means for demodulating a received call connection request signal into digital data;

a second means for extracting a phone terminal identification information contained in the demodulated data; and

a third means for outputting a signal of call arrival corresponding to the extracted phone terminal identification information.

8. A mobile phone terminal according to claim 7, wherein said third means outputs call arrival sounds which are different depending upon the extracted phone terminal identification information.

9. A mobile phone terminal according to claim 7, wherein

said third means vibrates differently depending upon the extracted phone terminal identification information.

10. A mobile phone terminal according to claim 7, wherein said third means displays an LED differently depending upon the extracted phone terminal identification information.

11. A mobile phone terminal according to claim 7, wherein said third means displays call arrival characters which are different depending upon the extracted phone terminal identification information.

12. A call responding method of a mobile phone terminal using a plurality of telephone numbers, comprising the steps of:

(a) demodulating a received call connection request signal into digital data;

(b) extracting a phone terminal identification information and a phone number identification information from the demodulated data; and

(c) determining how to respond to the call connection request based on the extracted phone number identification information.

13. A call responding method of a mobile phone terminal using a plurality of telephone numbers, comprising the steps of:

(a) demodulating a received call connection request signal into digital data;

(b) extracting a phone terminal identification information from the demodulated data; and

(c) determining how to respond to the call connection request based on the extracted phone terminal identification information.

14. A call responding method according to claim 12 or 13, wherein said step (c) comprises the steps of:

reading out data of call responding method stored in connection with the extracted phone terminal identification information;

checking if the read data of call responding method indicates call rejection; and

transmitting a call rejection signal to a base station based on said checked result.

15. A call responding method according to claim 12 or 13, wherein said step (c) comprises the steps of:

reading out data of call responding method stored in connection with the extracted phone terminal identification information;

checking if the read data of call responding method indicates call reverting to a voice mailing system; and

transmitting a call reverting signal to a base station

based on said checked result.

16. A call responding method according to claim 12 or 13, wherein said step (c) comprises the steps of:

reading out data of call responding method stored in connection with the extracted phone terminal identification information;

checking if the read data of call responding method indicates time-conditional call connection; and

transmitting a call connection restricting signal to a base station based on said checked result and current time.

17. A call responding method according to claim 12 or 13, wherein said step (c) comprises the steps of:

(c1) reading out data of call responding method stored in connection with the extracted phone terminal identification information;

(c2) checking if the read data of call responding method indicates region-conditional call connection; and

(c3) transmitting a call connection restricting signal to a base station based on said checked result and current location of the mobile phone terminal.

18. A call responding method according to claim 17, wherein said step (c1) transmits the call connection restricting signal based on said checked result and information identifying the base station contained in the

demodulated data.

19. A call responding method according to claim 12 or 13, wherein said step (c) comprises the steps of:

reading out pre-stored data of call responding method corresponds to the extracted phone terminal identification information;

checking if the read data of call responding method indicates user-conditional call connection; and

transmitting a call connection restricting signal to a base station based on said checked result and user's key selection.

20. A call processing method of a mobile switching node allowing a plurality of telephone numbers for single mobile phone terminal, comprising the steps of:

(a) searching a phone number identification information corresponding a called telephone number contained in a received call request signal;

(b) checking whether the phone number identification information discovered in said step (a) is associated with a mobile phone terminal using a plurality of telephone numbers; and

(c) processing the call request differently based on said checked result.

21. A call processing method according to claim 20,

wherein said step (c) comprises the steps of:

extracting data of call processing method stored in connection with the discovered phone number identification information; and

processing the call request differently based on the extracted data of call processing method.

22. A call processing method according to claim 20, wherein said step (c) comprises the steps of:

searching a phone terminal identification information corresponding to the called telephone number, the phone terminal identification information being stored in connection with the discovered phone number identification information based on the checked result; and

transmitting a call connection request signal consisting of both the discovered phone number identification information and phone terminal identification information to a mobile phone terminal.

23. A call processing method according to claim 20, wherein said step (c) comprises the steps of:

reading out data of call processing method stored in connection with the discovered phone number identification information;

checking if the read data of call processing method indicates call rejection; and

rejecting the call request based on said checked result.

24. A call processing method according to claim 20, wherein said step (c) comprises the steps of:

reading out data of call processing method stored in connection with the discovered phone number identification information;

checking if the read data of call processing method indicates call routing to a voice mailing system; and routing the call request signal to the voice mailing system based on said checked result.

25. A call processing method according to claim 20, wherein said step (c) comprises the steps of:

reading out data of call processing method stored in connection with the discovered phone number identification information;

checking if the read data of call processing method indicates time-conditional call connection; and

restricting call connection based on said checked result and current time.

26. A call processing method according to claim 20, wherein said step (c) comprises the steps of:

(c1) reading out data of call processing method stored in connection with the discovered phone number identification information;

(c2) checking if the read data of call processing method indicates region-conditional call connection; and

(c3) restricting call connection based on said checked result and current location of a mobile phone terminal to which the discovered phone number identification information corresponds.

27. A call processing method according to claim 26, wherein said step (c3) restricts call connection based on said checked result and an identification information of a base station paging the mobile phone terminal.

28. A call processing method of a mobile switching node allowing a plurality of telephone numbers for single mobile phone terminal, comprising the steps of:

(a) searching a phone number identification information corresponding a called telephone number contained in a received call request signal;

(b) checking whether the phone number identification information discovered in said step (a) is associated with a mobile phone terminal using a plurality of telephone numbers;

(c) adding a phone terminal identification information stored in connection with the discovered phone number identification information to a paging signal and transmitting the paging signal; and

(d) processing the call request based on a signal received from the mobile phone terminal responding to the paging signal.

29. A call processing method according to claim 28, wherein said step (d) comprises the steps of:

receiving the signal responding to the paging signal;
extracting a call responding data from the received responding signal; and

processing the request call differently according to the extracted call responding data.

30. A mobile phone system allowing a plurality of telephone numbers for single mobile phone terminal, comprising:

one or more mobile switching nodes of searching a phone number identification information corresponding to a called telephone number contained in a call request signal received via telephone network, detecting a phone terminal identification information associated with the discovered phone number identification information, and processing the call request differently based on the discovered phone number identification information and/or the detected phone terminal identification information; and

one or more mobile phone terminals of extracting a phone terminal identification information and/or a phone number

identification information from a call connection request signal received via radio from one of the mobile switching nodes, and determining how to respond to the call connection request based on the extracted phone number identification information.

31. A voice mailing method allowing a plurality of telephone numbers for single mobile phone terminal, comprising the steps of:

(a) searching for a phone terminal identification information corresponding to a called telephone number received via telephone network;

(b) checking whether the phone terminal identification information discovered in said step (a) is associated with a mobile phone terminal using a plurality of telephone numbers;

(c) transmitting a guiding message for voice recording based on said checked result; and

(d) storing both a received voice message and information on the discovered phone terminal identification information in a part of database, the part of database being separated from a storage area for previous voice messages.

32. A voice mailing method allowing a plurality of telephone numbers for single mobile phone terminal,

comprising the steps of:

(a) searching for a phone number identification information corresponding to a telephone number received via telephone network;

(b) checking whether the phone number identification information discovered in said step (a) is associated with a mobile phone terminal using a plurality of telephone numbers;

(c) transmitting a guiding message for voice recording based on said checked result; and

(d) storing both a received voice message and information on the discovered phone number identification information in a part of database, the part of database being separated from a storage area for previous voice messages.

33. A voice mailing method according to claim 31 or 32, further comprising the step of transmitting via radio a signal informing that a voice message has been arrived newly.

34. A voice mailing method allowing a plurality of telephone numbers for single mobile phone terminal, comprising the steps of:

(a) searching for a phone terminal identification information corresponding to a telephone number contained

in a call request received via telephone network;

(b) checking whether the phone terminal identification information discovered in said step (a) is associated with a mobile phone terminal using a plurality of telephone numbers; and

(c) retrieving both all of voice messages and information on phone terminal identification information associated with each voice message based on said checked result, the retrieved voice messages and the information being stored in connection with the plurality of telephone numbers.

35. A voice mailing method allowing a plurality of telephone numbers for single mobile phone terminal, comprising the steps of:

(a) searching for a phone number identification information corresponding to a telephone number received via telephone network;

(b) checking whether the phone number identification information discovered in said step (a) is associated with a mobile phone terminal using a plurality of telephone numbers; and

(c) retrieving both all of voice messages and information on phone number identification information associated with each voice message based on said checked

Parameter	Value	Unit	Parameter	Value	Unit
Temperature	25.0	°C	Pressure	1.0	atm
Time	1.0	h	Time	1.0	h
Concentration	0.1	M	Concentration	0.1	M
pH	7.0		pH	7.0	
Wavelength	254	nm	Wavelength	254	nm
Scan rate	1.0	nm/min	Scan rate	1.0	nm/min
Resolution	0.5	nm	Resolution	0.5	nm
Slit width	1.0	mm	Slit width	1.0	mm
Beam diameter	10.0	mm	Beam diameter	10.0	mm
Detector	Photodiode		Detector	Photodiode	
Amplifier	100	V	Amplifier	100	V
Integration time	1.0	s	Integration time	1.0	s
Sampling rate	1.0	Hz	Sampling rate	1.0	Hz
Resolution	0.5	nm	Resolution	0.5	nm
Slit width	1.0	mm	Slit width	1.0	mm
Beam diameter	10.0	mm	Beam diameter	10.0	mm
Detector	Photodiode		Detector	Photodiode	
Amplifier	100	V	Amplifier	100	V
Integration time	1.0	s	Integration time	1.0	s
Sampling rate	1.0	Hz	Sampling rate	1.0	Hz

FIG. 1

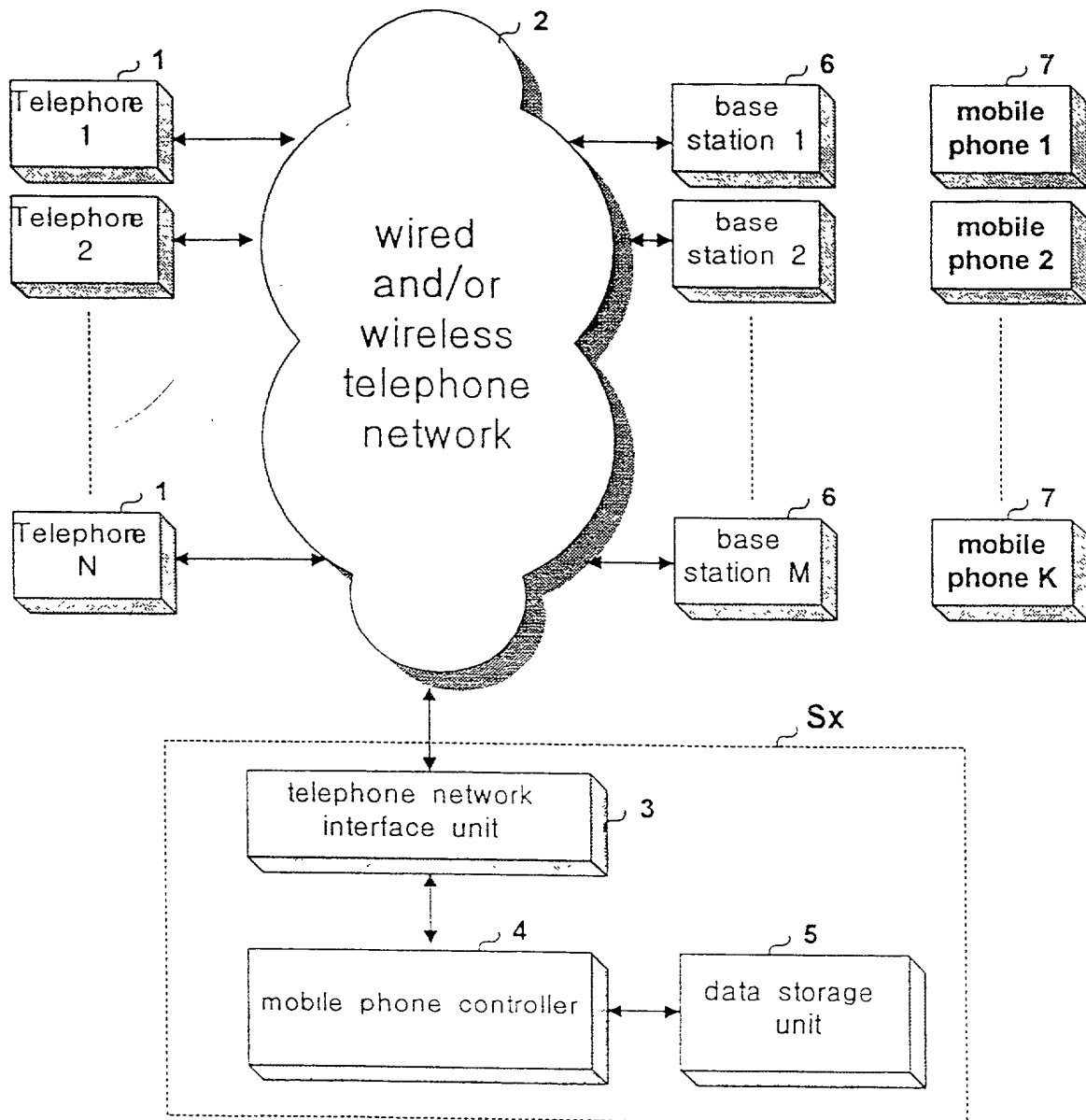


FIG. 2

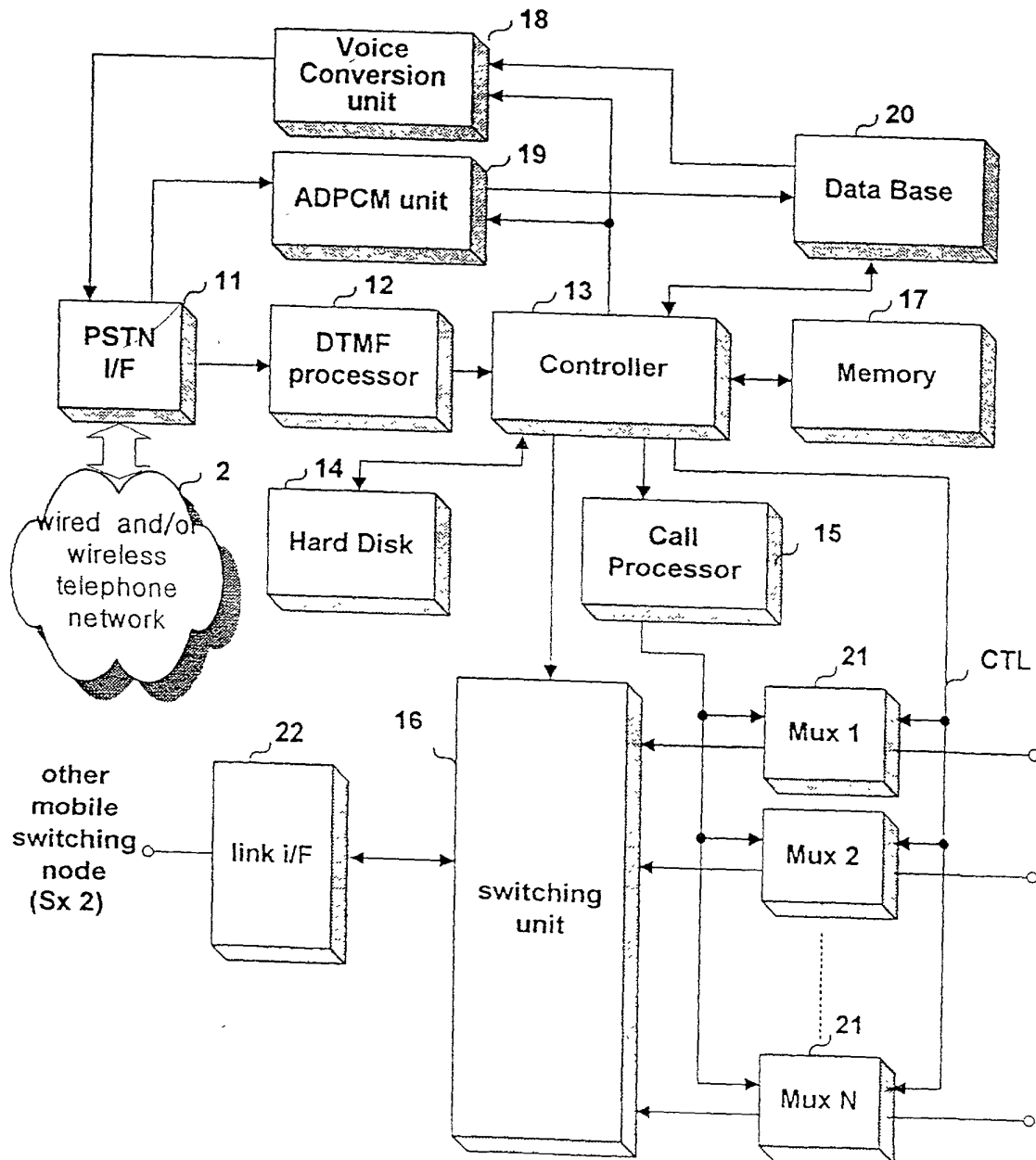


FIG. 3

Pilot Ch (1)	Sync Ch (1)	Paging Ch (7)	Traffic Ch (55)
-----------------	----------------	------------------	--------------------

FIG. 4

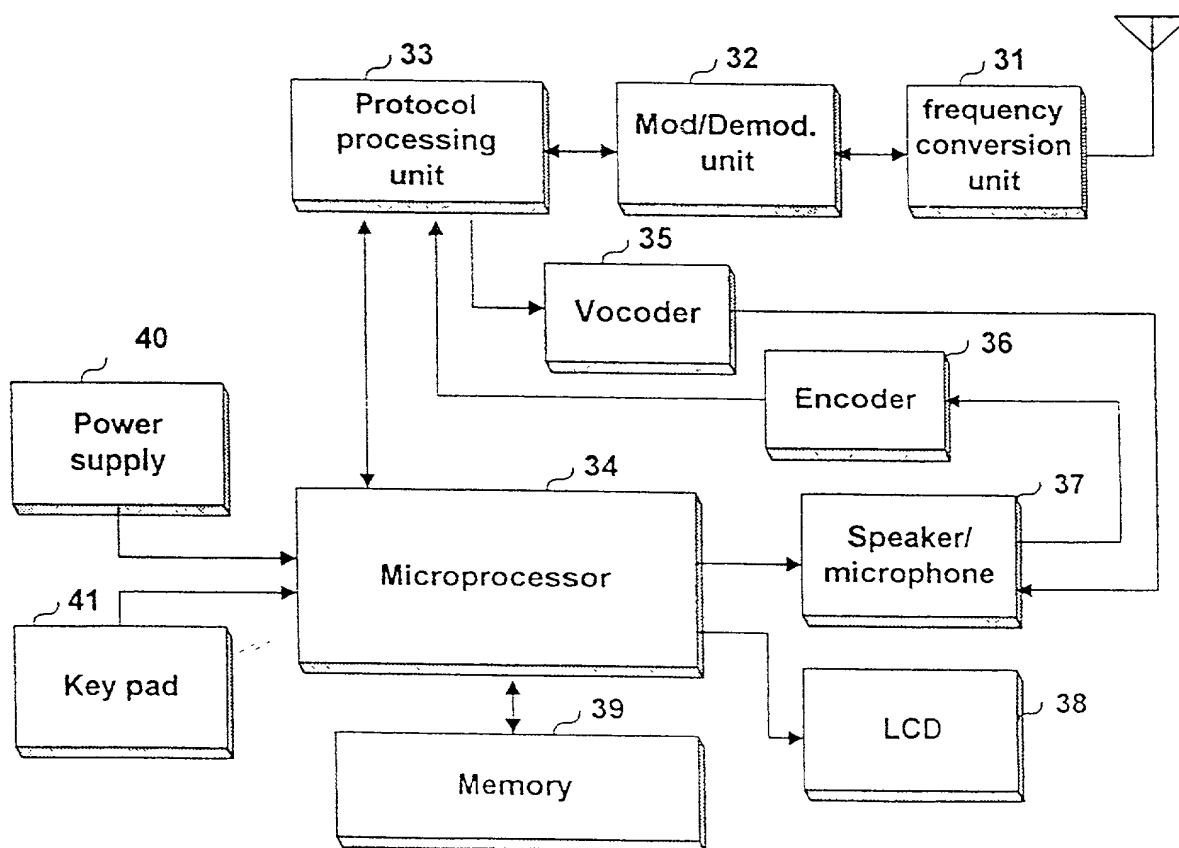


FIG. 5A

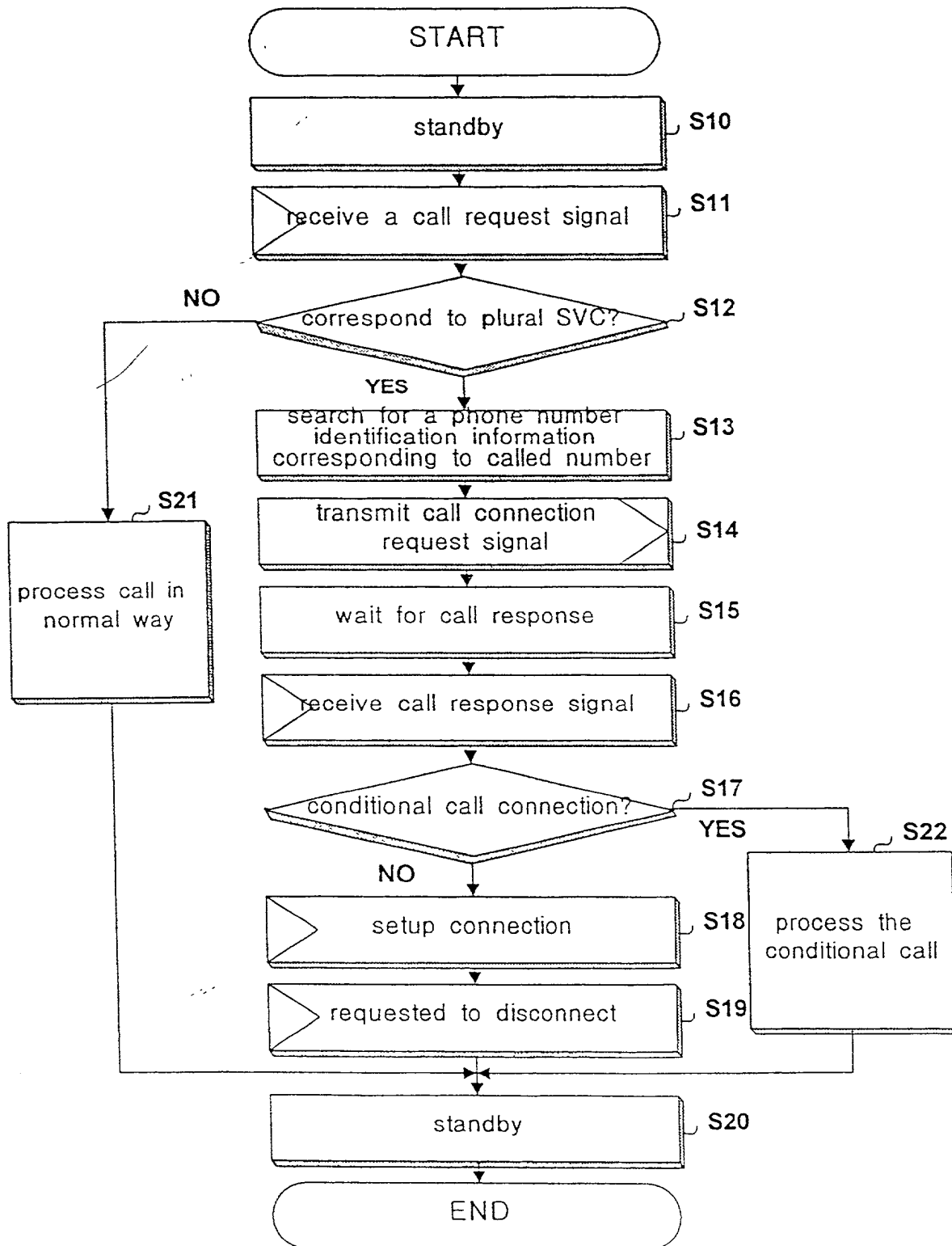


FIG. 5B

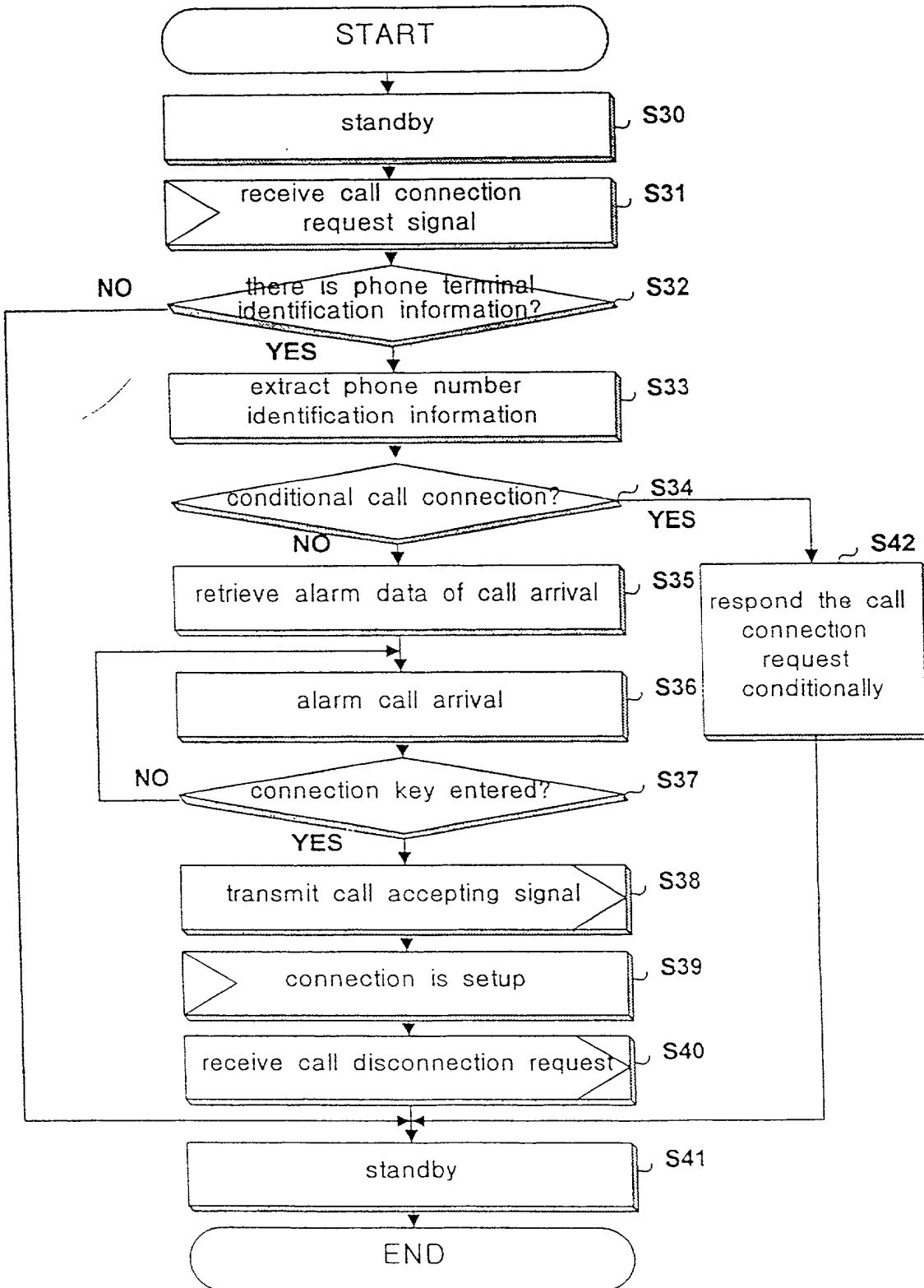


FIG. 6A

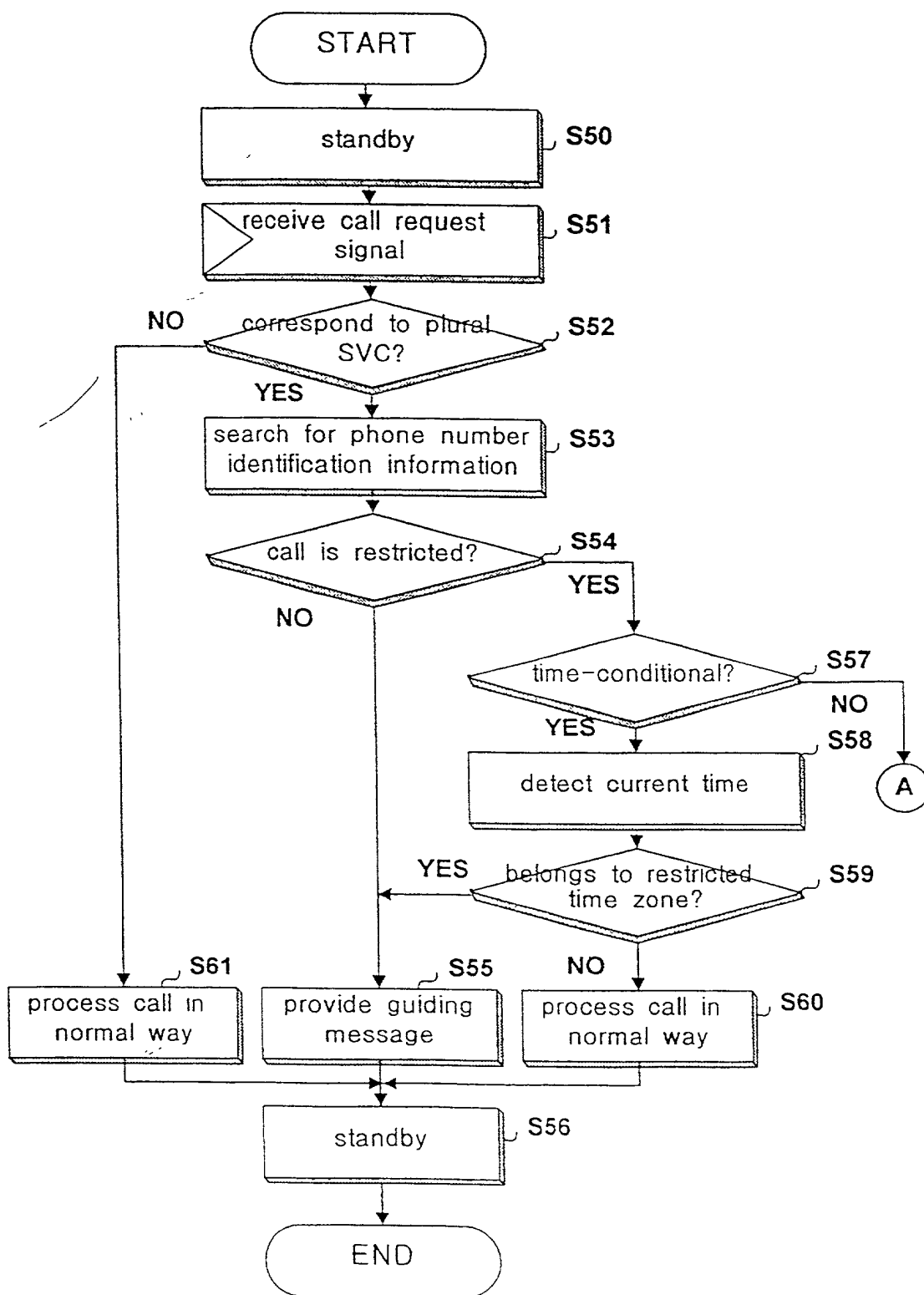


FIG. 6B

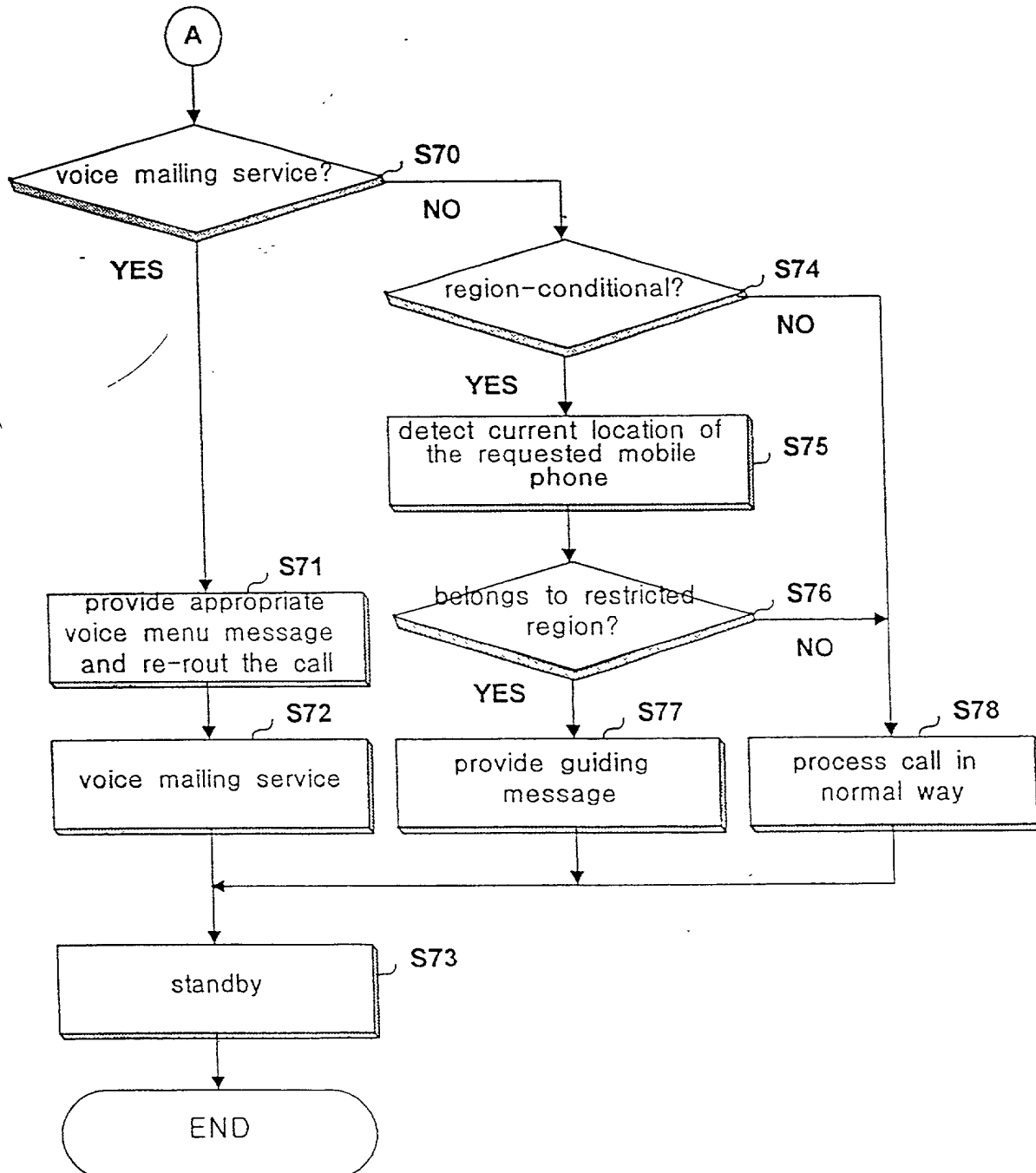


FIG. 7A

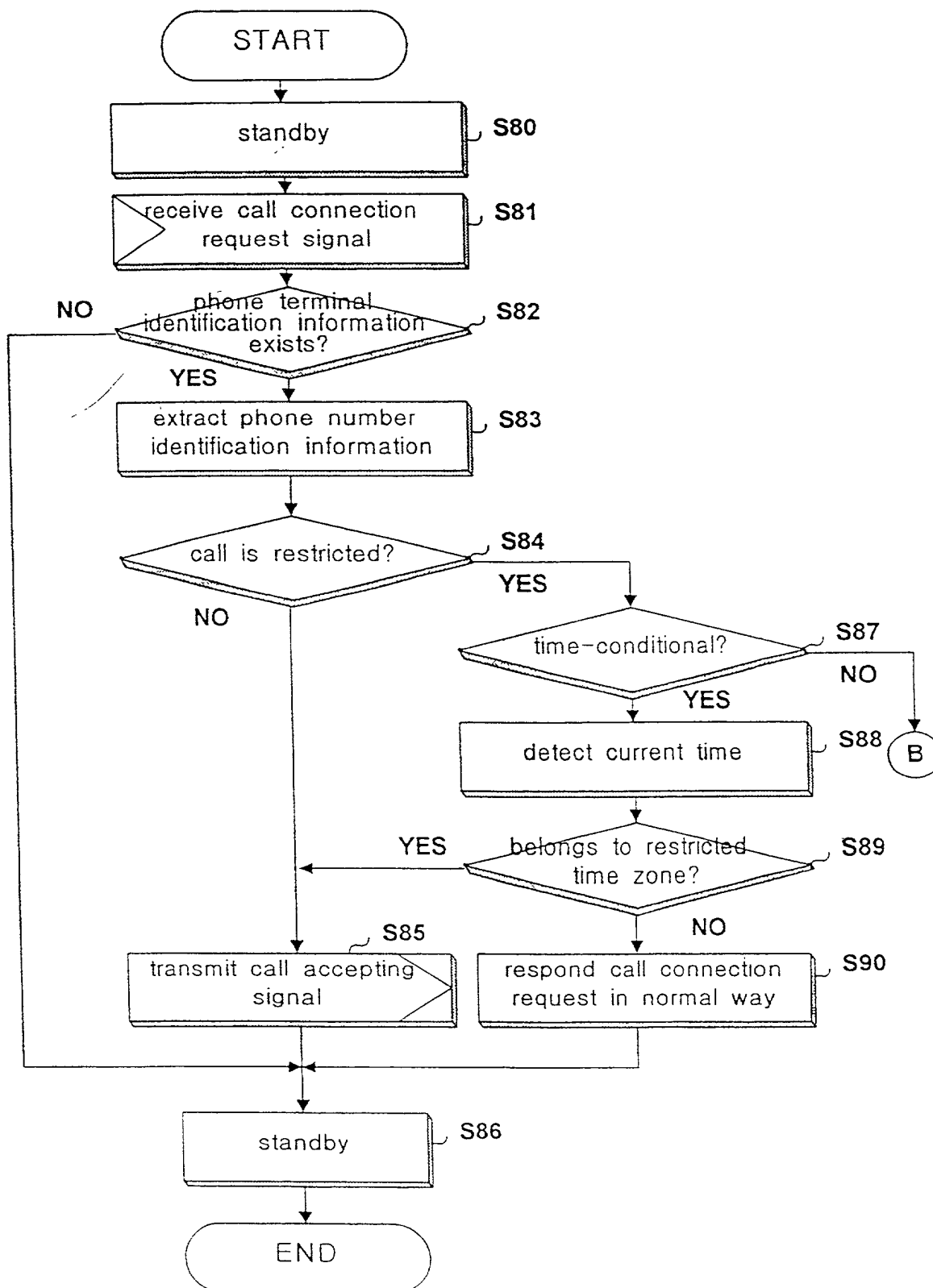


FIG. 7B

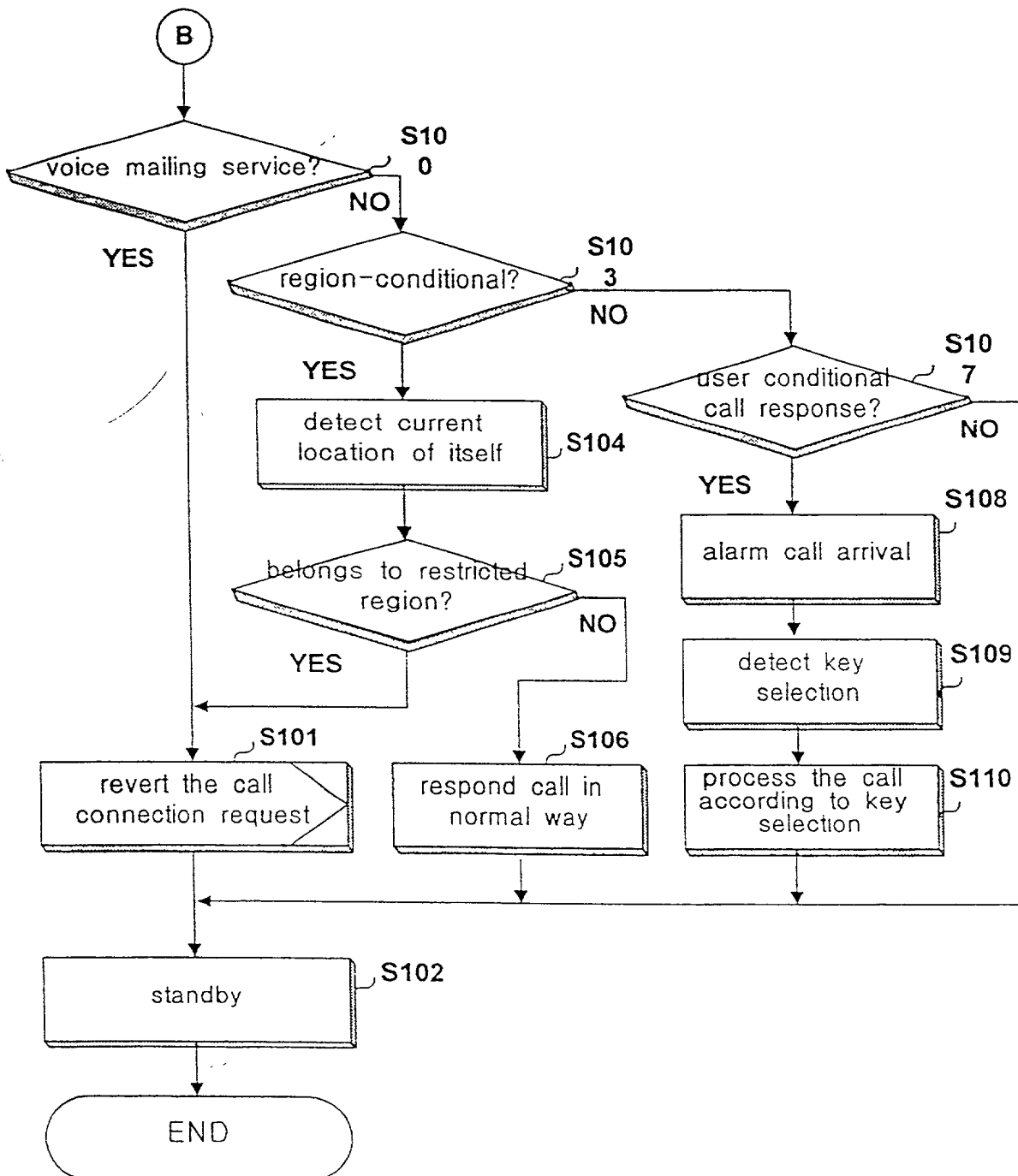
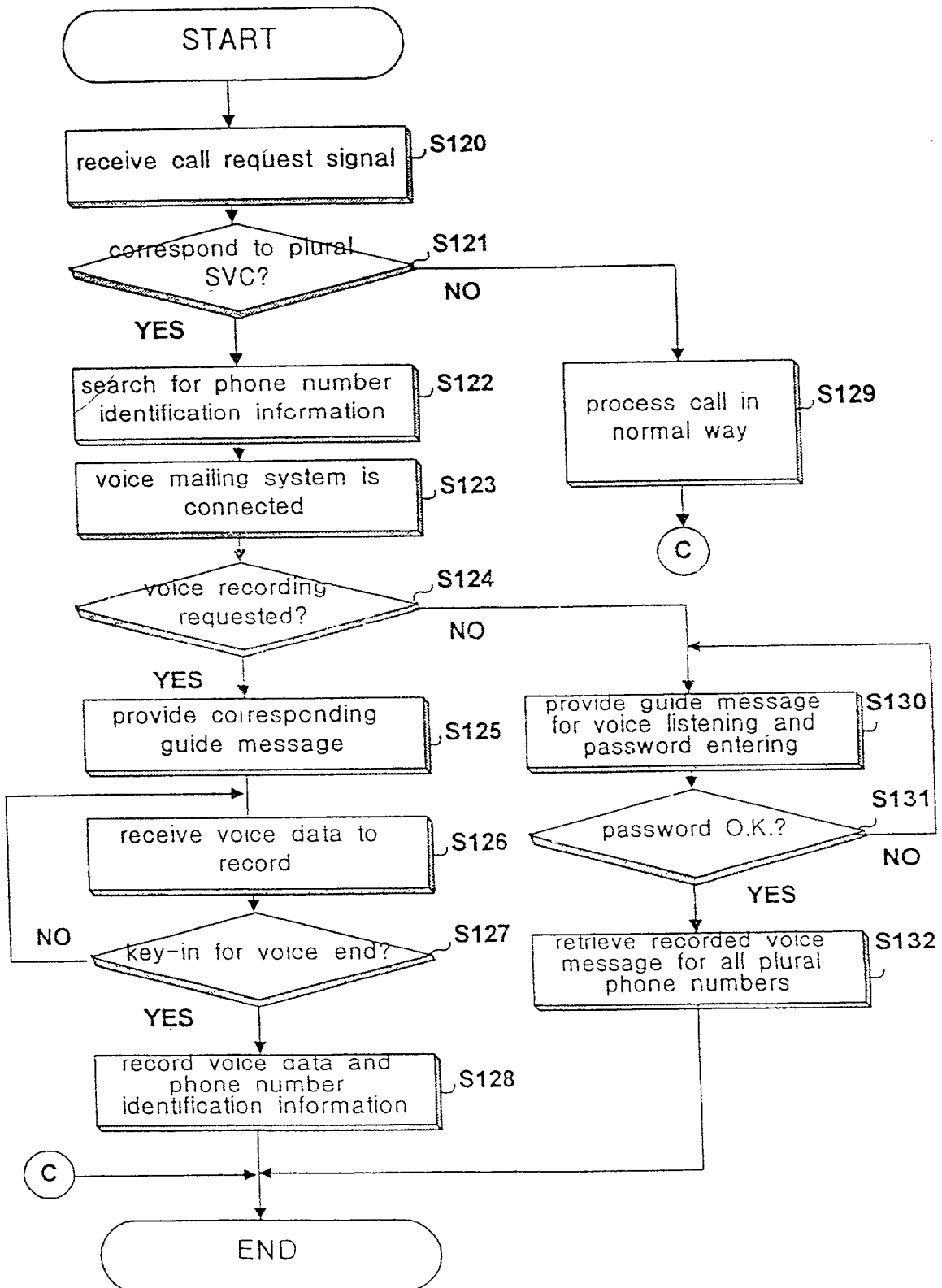


FIG. 8



N, M. M & O Docket No. _____

NIKAIDO, MARMELSTEIN, MURRAY & ORAM LLP

Declaration For U.S. Patent Application

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below my name.

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled

(Insert Title) MOBILE PHONE SYSTEM AND MOBILE PHONE TERMINAL USING A
PLURALITY OF TELEPHONE NUMBERS

the specification of which is attached hereto unless the following box is checked:

☒ was filed on Sep. 30, 1999 as United States Application Number or PCT International Application Number PCT/KR99/ and was amended on _____ (if applicable). 00595

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claim(s), as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to patentability as defined in 37 C.F.R. §1.56.

I hereby claim foreign priority benefits under 35 U.S.C. §119(a)-(d) or §365(b) of any foreign application(s) for patent or inventor's certificate, or §365(a) of any PCT International application which designated at least one country other than the United States, listed below and have also identified below any foreign application for patent or inventor's certificate or PCT International Application having a filing date before that of the application(s) for which priority is claimed:

(List prior foreign applications See note A on back of this page)	<u>98-41936</u>	<u>Korea</u>	<u>1 October 1998</u>	Priority Claimed
	(Number)	(Country)	(Day/Month/Year Filed)	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
	<u></u>	<u></u>	<u></u>	<input type="checkbox"/> Yes <input type="checkbox"/> No
	<u></u>	<u></u>	<u></u>	<input type="checkbox"/> Yes <input type="checkbox"/> No
	<u></u>	<u></u>	<u></u>	<input type="checkbox"/> Yes <input type="checkbox"/> No

I hereby claim the benefit under 35 U.S.C. §119(e) of any United States provisional application(s) listed below.

<u></u>	<u></u>
(Application Number)	(Filing Date)
<u></u>	<u></u>
(Application Number)	(Filing Date)

(See Note B on back of this page)

☐ See attached list for additional prior foreign or provisional applications.

I hereby claim the benefit under 35 U.S.C. §120 of any United States application(s) or §365(c) of any PCT International application(s) designating the United States of America listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior application(s) (U.S. or PCT) in the manner provided by the first paragraph of 35 U.S.C. §112, I acknowledge the duty to disclose information which is material to patentability as defined in 37 C.F.R. §1.56 which became available between the filing date of the prior application and the national or PCT International filing date of this application.

(List prior U.S. Applications or PCT International applications designating the U.S.)	<u></u>	<u></u>	<u></u>
	(Application Serial No.)	(Filing Date)	(Status) (patented, pending, abandoned)
	<u></u>	<u></u>	<u></u>
	(Application Serial No.)	(Filing Date)	(Status) (patented, pending, abandoned)

And I hereby appoint as principal attorneys David T. Nikaido, Reg. No. 22,863; Charles M. Marmelstein, Reg. No. 25,895; George E. Oram, Jr., Reg. No. 27,931; Robert B. Murray, Reg. No. 22,980; Martin S. Postman, Reg. No. 18,570; E. Marcie Emas, Reg. No. 32,131; Michael G. Gilman, Reg. No. 19,114; Douglas H. Goldhush, Reg. No. 33,125; Kevin C. Brown, Reg. No. 32,402; Monica Chin Kitts, Reg. No. 36,105; Sharon N. Klesner, Reg. No. 38,335; and Richard J. Berman, Reg. No. 39,107.

Please direct all communications to the following address: NIKAIDO, MARMELSTEIN, MURRAY & ORAM LLP
Metropolitan Square
655 Fifteenth Street, N.W., Suite 330 - G Street Lobby
Washington, D.C. 20005-5701
(202) 638-5000 Fax: (202) 638-4810

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further, that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

(See Note C on back of this page)

Full name of sole or first inventor Deok Woo KIM
 Inventor's signature [Signature] Date 30 Mar 2001
 Residence 102-1303, Sungwon Apt., 4-ga, Yangpyeong-dong,
 Citizenship Korea Youngdeungpo-gu, Seoul, 151-051, Korea
 Post Office Address : Same as above

SMALL ENTITY DECLARATION

APPLICANT OR PATENTEE _____
 SERIAL NO. _____ ☐ PATENT NO. _____ ATTORNEY'S
 DOCKET NO. _____

☐ 1. FILED OR ISSUED _____

☐ 2. SUBMITTED HERewith
 FOR MOBILE PHONE SYSTEM AND MOBILE PHONE TERMINAL USING A PLURALITY
OF TELEPHONE NUMBERS (Insert Title)

I (we) hereby declare that I (we) am (are) entitled to the benefit of small entity status with respect to the above-identified application or patent for purposes of paying reduced fees under 35 U.S.C. § 41(a) and (b) to the U.S. Patent and Trademark Office.

☐ A. INDEPENDENT INVENTOR

I (we) qualify as (an) independent inventor(s) as defined in 37 C.F.R. § 1.9(c).

☐ B. INDIVIDUAL NON-INVENTOR

I (we) would qualify as (an) independent inventor(s) as defined in 37 C.F.R. § 1.9(c) if I had made the invention.

☐ C. SMALL BUSINESS CONCERN

I am ☐ THE OWNER ☐ AN OFFICIAL of the small business concern identified below and am empowered to act on behalf of the concern. The concern qualifies under 37 C.F.R. § 1.9(d) and 13 C.F.R. § 121.3-18. Rights under contract or law have been conveyed to and remain with the concern and are exclusive unless a checkmark is placed here ☐. All other rights belong to small entities as defined in 37 C.F.R. § 1.9.

☐ D. NON-PROFIT ORGANIZATION

I am an official empowered to act on behalf of the non-profit organization identified below. The organization qualifies under 37 C.F.R. § 1.9(e), subsection: ☐ (1) ☐ (2) ☐ (3) ☐ (4). Rights under contract or law have been conveyed to and remain with the organization and are exclusive unless a checkmark is placed here ☐. All other rights belong to small entities as defined in 37 C.F.R. § 1.9.

I (we) acknowledge the duty to file, in this application or patent, notification of any change in status resulting in loss of entitlement to small entity status prior to paying, or at the time of paying, the earliest of the issue fee or any maintenance fee due after the date on which status as a small entity is no longer appropriate [37 C.F.R. § 1.28(b)].

I (we) declare under penalty of perjury under the laws of the United States of America that the foregoing is true and correct.

A. INDEPENDENT INVENTOR(S) B. INDIVIDUAL NON-INVENTOR(S)

_____ Name	_____ Signature	_____ Date
_____ Name	_____ Signature	_____ Date
_____ Name	_____ Signature	_____ Date

C. BUSINESS CONCERN D. NON-PROFIT ORGANIZATION

WOORIGISOOL INC. 1595-1, Bongchun 7-dong, Kwanak-qu,
 Name of Concern or Organization Address Seoul 151-057, Republic
 By Deok Woo KIM D.W.K. of Korea
 Name of Person Signing Signature
Representative 30 Mar. 2001
 Title Date